

OK TO ENTER
SMH 04-17-2006

S/N: 10/617,940
Reply to Office Action of January 20, 2006

Atty Dkt No. GSIL 0117 PUSA 1

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.-38. (cancelled)

39. (original) A laser-based method of high resolution marking of printed circuit boards (PCBs), chip scale packages (CSPs), microball grid arrays (u-BGAs) or similar articles, or marking pre-determined locations related to the articles, the articles being disposed on a surface, mounted on a substrate, constrained within pockets of a compartmentalized tray, secured to a pallet, or otherwise supported by a surface at a laser marking station, the marking to occur with a focused laser marking beam at a laser marking beam location within a marking field, the method comprising:

receiving articles at the marking station;

imaging one of the articles, the imaged article having a feature suitable for detection with an optical sensor to obtain an image;

locating the feature of the imaged article in the image to obtain a feature location;

calculating an offset to relate the feature location to a marking location;

generating a displacement control signal based on the offset;

setting a laser marking beam location based on the displacement control signal so that the marking beam location substantially coincides with the marking location within a marking field, the marking field being substantially smaller than a field that covers all the articles supported at the marking station; and

generating, directing, and focusing a laser beam to produce a focused laser marking beam so that the marking beam forms at least one mark at the marking location within the marking field wherein the step of imaging is carried out with an optical sensor located disjoint from an optical axis of the laser marking beam.